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ABSTRACT

To provide the most effective instruction, materials, and support for beginning readers, teachers need to know if young children are more likely to process from print to meaning-- bottom-up or text-driven processing--or to interpret print to follow meaning--top-down or concept-driven processing. While some studies reveal a correlation between beginning reading instruction and reading strategies used by students, others indicate that, irrespective of the strategies taught, good readers combine top-down and bottom-up processing. In a case study focusing on reading development, a four-year-old child learned to read from the words and meaning in her own repertoire. Miscue analysis of her tape-recorded reading of basal texts showed that she was processing unfamiliar texts using an effective interaction of concept-driven and text-driven strategies. The study suggested that if children are too dependent either on expectations they bring to the text or on print as the sole source of meaning, they will be poorly equipped to handle the complexities of unfamiliar passages. Teachers therefore need to make children aware of the different reading strategies available to them. (MM)

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THEORETICAL MODELS OF READING: IMPLICATIONS FOR THE BEGINNING READER

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With knowledge of the necessary interaction of text-driven and concept-driven processes, teachers can encourage readers to use all available knowledge from the head (top) and the page (bottom). A case study of one five year old documents how such interactive processing occurs naturally in some beginning readers.

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THEORETICAL MODELS OF READING: IMPLICATIONS FOR THE BEGINNING READER

Otto (1982) has identified bottom-up versus top-down processing as being "the new debate in reading theory" (p. 14). The theoretical ramifications of the debate are both intriguing and important. In addition, a practical by-product of the debate may be a new perspective for viewing the reading process, especially in the crucial beginning stages. With a full understanding of processing theories, teachers will be able to add to their informal assessment data by asking, to what degree is this child, in this material, a top-down processor or a bottom-up processor?

It is important for teachers to understand the implications of both text-driven (bottom-up) and concept-driven (top-down) theories. As Strange (1980) pointed out, "a theory becomes useful when it allows us to interpret what children do as well as make judgments concerning appropriate instruction" (p. 391). As I read Gough's (1972) "One Second of Reading," I made the connection to a hot classroom in 1970, when Juletha and I struggled to sound out words in her Sullivan reader. Her text-driven processing was laborious, until she caught the pattern (man, tan, fan, can), at which point automaticity (LaBerge & Samuels, 1976) accelerated both her reading and her smile. As I read Goodman (1967) and Smith (1971), I thought of Luke as he read me his caption on a scary picture: "BLD VAPPR." Without the exciting, immediate concept of a bloody vampire during his reading, that collection of letters might have been nothing more.

While each theory of the reading process can be interpreted through an individual teaching/learning experience, no one theoretical extreme accounts

for all the Julethas and Lukes teachers encounter through the years. Only a theory that accounts for both text-driven and concept-driven reading is genuinely sound and useful. Rumelhart's (1977) interactive model depicts reading as a complex process involving textual and conceptual interactions. It has gained acceptance as a sound theory (Harris & Sipay, 1980; Lovett, 1981) of reading, especially by those who refuse to be polorized in either top-down or bottom-up direction. Thorough reading of leading top-down and bottom-up proponents reveals support for differential access, or dependence, on text or reader-generated meaning. Goodman (1975) noted that visual information, or graphophonic cues, are used to the degree needed to support meaning hypotheses. Less skilled readers (or readers in less familiar or predictable material) must rely more heavily on the text if they are to read accurately. The LaBerge and Samuels model also "addresses the possibility that 'top-down' (or more cognitive) and 'bottom-up' components of the process interact" (Lovett, 1981, p. 10).

Relationship of Instructional Emphasis to Processing Strategy

What is the beginning reader most likely to do, process from print to meaning, or interpret print to follow meaning? If teachers are able to answer this question, they may provide instruction, materials, and support for the young word processor. One obvious answer is that children will use the processing strategy they have been taught. If the emphasis has been on breaking the code, children should look to graphic cues as they process new material. If the emphasis has been on reading as a meaningful experience, children should refer to their experiences, lexicons, and language structures.

Several studies support a direct, positive correlation between beginning reading instruction and reading strategies (Biemiller, 1970; Bridge, Winograd,

and Haley, 1983; Cohen, 197475; Weber, 1970). Beginning readers in a meaning-emphasis basal program showed different error phases than beginning readers in a code-emphasis program. Biemiller (1970) noted that the sight-word basal children tended to be top-down processors. In the first phase, miscues were contextual errors based on known words and picture cues. The second phase was no response; they knew they didn't know. The third phase included some phonetic analysis, and substitutions of semantically acceptable words. Cohen (1974-75), who studied children learning from a "phonic method" basal, found that her subjects were text driven in their responses to unknown words. The first phase was "no response," or "uncertainty as to how to express the relationship between letters, sounds, and words" (p. 616). In the second phase, readers produced nonsense "words" based on graphophonic cues. The third phase was substitution, just as it was for Biemiller's subjects. Cohen noted that these substitutions showed an increase "in the use of those strategies which employ both meaning and graphic aspects of word identification" (p. 646).

It is important to note that good readers in both studies had reached the same point by the end of first grade: their reading evidenced an interaction of top-down and bottom-up processing. Again, their ability to integrate graphic, syntactic, and semantic cues may have been at least partially the result of instruction. Biemiller's subjects were taught in a basal that emphasized whole words, but there most likely was a slow-paced phonetic component. Cohen's subjects started with sounds in their Open Court program, but proceeded to words and sentences by mid-year (Cohen, 1974-1975, p. 623). In neither study were teachers monitored extensively; therefore, it is quite probable that they at least suggested variable processing strategies (e.g.,

"Does that make sense? What does the word begin with? Come back to that one after you've read the rest of the sentence.")

What would be the predicted miscue pattern in a totally meaning-oriented approach to reading? Sight-word basals emphasized meaning mainly at the word level, or through simple, stilted sentences of the See-spot-run variety. In a total meaning approach, such as language experience, would children still develop an interactive processing strategy? Beck (1981) was skeptical that bottom-up processing would occur in such a meaning-emphasis program. She noted that "children are left to induce the letter-sound correspondences from their sight word repertoires . . . . One has to question seriously whether children are likely to acquire the correspondence from such instruction" (p. 67).

Others argue that children can and do learn to use the graphophonic cue system. Torrey (1979) pointed out that children who learn to read naturally (self-taught readers) "may get most of their word information from the semantic cue system" just as children reading their own stories do; however, "it is certainly not impossible for them to get graphophonic information" (p. 133). Torrey supported the view that phonics generalizations were inferred by these beginning readers, a view held by Chomsky (1981) based on her experiences with young readers and writers. Not only does this induction occur, but it is an active, discovery process that is better than direct instruction of phonetic rules because the reader is more involved (Chomsky, 1981, p. 149). While proponents of a language experience approach have found that children often do learn phonics inductively, they emphasize the instruction of phonics to those children who do not automatically pick up on generalizable elements (Stauffer, 1980; Veatch, Sawicki, Elliot, Barnett, and Blakey, 1979).

A Case Study

Rachel asked me to teach her to read the spring she was four. Believing with Torrez that "the most striking characteristic of early reading is that it comes at the initiative of the child" (1979, p. 141), I was excited, but remained cautious. Rachel would not be entering kindergarten, due to a September birthday, and I certainly didn't want to rush her into reading if she was not both motivated and capable. I waited for further signs. One day in September, Rachel looked up at me indignantly and said, "I thought you were going to teach me how to read!" I decided to start her out with a few key words (Veatch et al., 1979) to see if she was indeed ready.

Rachel quickly learned a word a day and proceeded through word pairs, captions, sentences, and stories. Her key words included the exotic (igloo, kingdom, vitamin) and the mundane (from "So I can sign my letters" and the "I need it to write stories"). Word pairs were at her insistence, because "Sesame doesn't make sense without Street," and "I won't remember throat culture unless you write them together."

We enjoyed a leisurely, unstructured learning pace for the next several months. In March, I asked Rachel's assistance in a project I needed for the reading methods class I was teaching. In order to teach my preparatory teachers how to score an informal reading inventory, I needed a tape of someone producing reading miscues. Rachel had never read in material she had not written so I felt certain I would have ample miscues. My only hesitation was that Rachel would not be able to read the material at all, and would become frustrated.

Rachel was enthusiastic about reading the Ginn Informal Reading Inventory (1976) passages. She had developed an extremely positive attitude about

reading through our work together; further, the idea of hearing herself read on the tape recorder intrigued her. She began with Level 3 (preprimer 2) and reached overt frustration on Level 6 (first reader). She was quite proud of herself; I was amazed at the extent of transfer from familiar, predictable materials to basal passages; and I had an effective teaching tool--more effective than I originally realized.

As I listened to the tape on repeated occasions, I heard a little more, analyzed a bit deeper each time. Eventually I was able to go from a surface level of analysis (substitution, mispronunciation, insertion) to a startling insight. This reader, who had learned to read from the words and experiences in her own repertoire, where meaning had been the sole basis of instruction, was processing unfamiliar texts using an effective interaction of concept-driven and text-driven strategies.

Analysis of Miscues

Miscue analysis is one of the few available techniques for examining the reading process. It may prove to be a method of testing the hypotheses of various models of reading, a needed extension of their theoretical development (Lovett, 1981). Goodman (1979, p. 144) agreed that miscue analysis is an important bridge between theory and research:

> . . . reading research has experienced more creative research methodology with more ecological validity and more relationship to theory and practice. . . . Still, miscue research and some uses of cloze research are the only attempts to look directly at real reading by real subjects of real texts as it is taking place.

Analysis of substitutions has been shown to yield the most useful information (Beebe, 1979-80; D'Angelo and Mahlios, 1983). Indeed substitutions (including mispronunciations) were the only miscues available for analysis (see Figure).

Insert Figure about here

The instructions from the tester are included in the transcription because there was an obvious concept-driven miscue as a result of the first (incorrect) setting of purpose. Rachel's first miscue is on the word funny. Her first attempt at it combines the initial and final graphemes /f/ and /y/ with recent concept knowledge that the story was about a father. Her first attempt was fathery. Her second attempt relied more heavily on textual cues, most likely some awareness of syllables, producing the less-meaningful fathy. Her discomfort with this non-word attempt, and later with aut for airport, was evident in the question mark in her voice and the fact that she looked to me for help. (As testing progressed, she warned, "Don't tell me!" as she struggled to pronounce unknown words.)

The seconder miscue occurred on the word helicopter. Again, there is evidence of the influence of both concepts and text. The Level 3 passage was about some children who help a turtle. The word help was in the passage twice. Rachel's miscue helper tied recent experience with the word help to a word in which the letters h - e - l - p - e - r occurred in order; further, the morpheme er was at the end of both words.

In several instances Rachel used a sound and blend technique (need, can, but). In each case, it was after pronouncing a nonsense word, indicating monitoring of her reading for meaning. When she got the right word (need, can) she knew immediately and went on to read the phrase fluently. However, when she pronounced but as boot, she said it as a question, aware of the semantic inconguity.

Implications

The application of theoretical models of reading to oral reading miscues holds implications for theory, research, and practice. Neither top-down nor bottom-up theory alone can account for Rachel's miscues. An interactive theory, in which meaning and print form a symbiotic relationship is strongly supported in the case study as well as in the advanced phases of the Biemiller (1970) and Cohen (1974-1975) studies. A second implication supports the language experience theory of inferred phonetic generalizations. At least in some cases, Beck's (1981) skepticism is unfounded.

Researchers should utilize miscue analysis in testing the hypotheses of reading models. Biemiller (1970) and Cohen (1974-75) demonstrated the predominant pattern of miscues for sight-word and phonic methods. Is there earlier interactions for individuals in one approach? Now that basals are "eclectic," does the ability to use both top-down and bottom-up processes occur sooner than in non-eclectic material? Is an overdependence on top-down or bottom-up processing always characteristic of poor decoders, as Cohen's (1974-75) study indicated? Do children who teach themselves to read automatically possess interactive strategies? What effect does setting the purpose for reading, an important variable for comprehension, have on decoding? Do the results of the case study reported here generalize to larger populations of language-experience learners?

In examining the implications for the practice of reading instruction, we are back to the question posed at the beginning of the article: To what degree is this child, in this reading material, a top-down processor or a bottom-up processor? If children are too dependent on either expectations they bring to the text, or print as the sole source of meaning, they are

poorly equipped to handle the complexities of unfamiliar passages. Teachers can encourage students to use all available knowledge "from the head (top) down to the page (bottom) and back up." As teachers make children aware of the many options in reading, children become more cognizant of which strategies they can employ and when it may be beneficial to call on a different approach (Paris, 1983). In short, teachers would be fostering the awareness that reading is indeed an interactive process.

Oral Reading Transcription: Ginn Level 4

Tester: This one is about a father and his daughter who are talking about some things that they are looking at. Oh, no. We're not going to do that one. This one's the story about some children and a man who is going someplace. This man's in a big hurry. Let's find out why he's in a hurry and what he's going to do.

Reader: What a fathery/fathy? /(Tester Pronounced) helper/(TP)
Text: What a funny . helicopter.

Reader: It looks old.
Text: It looks old.

Reader: I node/n-ee-d/ I need to get to the big aut?/(TP)
Text: I need to get to the big airport

Reader: in thum/time for the jet.
Text: in time for the jet.

Reader: Cun/C-an/can this funny old helicopter get me
Text: Can this funny old helicopter get me

Reader: to the airport?" said the man.
Text: to the airport?" said the man.

Reader: This helicopter likes/looks old and
Text: This helicopter looks old and

Reader: it looks funny.
Text: it looks funny.

Reader: Bod/bat/b-u -t/boot? it can get you to the big airport
Text: But it can get you to the big airport

Reader: in time for the jet.
Text: in time for the jet.

Reader: Get in/on/in!
Text: Get in.

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